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Formulation and Evaluation of Herbal Soap

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ABSTRACT

Herbal soaps, primarily composed of herbs and plant-based ingredients, offer a natural alternative to traditional synthetic soaps. Gaining popularity for their therapeutic benefits, low chemical content, and environmental sustainability, these soaps are gentler on the skin and less likely to cause irritation or allergic reactions. Common ingredients like aloe vera, rose water, turmeric powder, and Solanum extract each provide distinct benefits—turmeric acts as an antibacterial and anti-inflammatory agent, Solanum extract soothes irritated skin and combats skin diseases, rose water maintains pH balance and refreshes the skin, and aloe vera hydrates and heals. Unlike chemical-based products that may harm both skin and the environment, herbal soaps are biodegradable and safer for long-term use. This study highlights their effectiveness in preventing environmentally induced skin issues and promoting both skin and ecological health, positioning herbal soaps as a safe, effective, and eco-friendly alternative to synthetic skincare products.

Keywords: Cosmetics, Herbal Soap, Skin Care, Eco-Friendly, Non-Toxic, Skin Health

INTRODUCTION

A variety of natural components sourced from different plants and herbs are used to make herbal soap.[1]Herbal soap is frequently made with herbs including chamomile, lavender, mint, and rosemary.[2] People with dry or sensitive skin frequently choose herbal soap because of its well-known calming, revitalizing, and healing qualities.[3], [4], [5], [6]In recent years, herbal soaps that are enhanced with natural extracts and essential oils from a variety of medicinal plants have grown in popularity.[2], [7]Plant extracts with distinct medicinal qualities, such as turmeric (Curcuma longa), aloe vera (Aloe barbadense miller), and kantakari (Solanumvirginianum) are frequently included in the manufacturing of herbal soaps.[8], [9] Herbal soap, a natural alternative to conventional soaps, has gained popularity among skincare enthusiasts seeking gentle yet effective cleaning solutions.[1], [7], [10],[1]The recipes for herbal soap, inspired by the rich offerings of nature, incorporate plant extracts, essential oils, and herbal infusions known for their therapeutic and skin-rejuvenating properties.[1], [11], [1], [12]In this overview of herbal soap, we examine the key characteristics , benefits and applications of this natural skincare essential.[7]In this study, we will explore various botanical ingredients used in herbal soap formulas and their related benefits for skin enhancement.[7]Each herbal element, from soothing chamomile and lavender to invigorating peppermint and rosemary, contributes to a unique sensory experience while offering significant benefits for the skin's health and wellness.[2]furthermore, we will examine the science behind herbal soap, investigating the therapeutic advantages of plant based compounds for various skin conditions such as inflammation, eczema acne.[3], [11], [1]In conclusion, this introduction establishes the foundation for an in-depth exploration of herbal soap, a natural skincare item that celebrates the allure of plants and the therapeutic abilities of nature.[1]Herbalsoap, enriched with the wisdom oftraditional herbal remedies and the principles of modern green beauty, stands out as a classic companion in the quest of radiant, healthy skin as buyers increasingly priorities authenticity, sustainability, wellness in their skincare choices.[13], [14], [15]

There is a growing consumer demand for herbal products due to their natural origin and minimal or no side effects, making them a preferred alternative to synthetic counterparts. People are increasingly seeking to avoid synthetic substances in favour of natural options that align with health and wellness trends. This shift not only highlights the safety and efficacy of herbal remedies but also opens up significant potential for commercial growth and research advancements in the field of natural therapeutics.[7]

Herbal soaps, made from plant-based ingredients and medicinal herbs, have gained significant attention due to their therapeutic and antimicrobial properties.[13], [14], [15] Majumdar et al. discussed the trends and benefits of herbal soaps, emphasizing their natural composition.[7]WijayaWardhana et al. explored the antimicrobial activity of combined plant extracts from Sri Lanka, highlighting the enhanced effect when extracts are used in combination.[16] Bhujbal et al. and Munde et al. formulated and evaluated herbal soaps using various natural ingredients known for their antibacterial, anti-inflammatory, and antifungal properties.[1] Chaudhari studied the antimicrobial efficacy of

commercial antiseptic and herbal soaps against skin pathogens like Staphylococcus aureus and Escherichia coli.[15]FatkhilHaque et al. formulated liquid hand soap using cayenne pepper leaf extract, demonstrating its antibacterial activity.[17] Similarly, Chakraborty et al. aimed to create non-toxic, eco-friendly herbal soaps using neem and turmeric extracts.[12]Chandira Margret et al. developed soaps using the melt-and-pour method with ingredients like kapok gum and olive oil, targeting conditions like eczema and acne.[18]Dr. Seetha Devi and team formulated herbal soaps with oils of Azadirachtaindica and Osmium tenuiflorum, confirming antibacterial activity through agar well diffusion.[11] Sindhu Rakesh et al. prepared polyherbal soap using cold process methods and evaluated various physicochemical and antimicrobial parameters.[19] Gerges et al. compared the antibacterial activity of herbal and commercial soaps in the Lebanese market, emphasizing the importance of hand hygiene.[2]Tangatarova et al. studied herbal soap from stinging nettle, effective in treating skin diseases like acne and dermatitis.[6]Gor and Gondaliya focused on polyherbal acne soap formulation using selected medicinal plants for skin conditions caused by bacterial infections.[20] Das et al. used a factorial design approach to optimize herbal soap formulation for acne and dry skin treatment.[4] Anjum et al. highlighted the historical and modern significance of herbal remedies, especially for acne caused by Propionibacterium acnes and other bacteria.[21] Lastly, Devipriya et al. formulated herbal soap using Borassusflabellifer and Curcuma zedoaria, reinforcing the antibacterial and antifungal potential of traditional medicinal plants.[9]Overall, these studies collectively confirm the growing interest and efficacy of herbal soaps in managing skin infections and improving dermal health.

COSMETIC

Herbal soaps, known for their plant-derived ingredients and essential oils, have gained prominence in the cosmetics industry due to their therapeutic benefits and skin-friendly properties, distinguishing them from conventional soaps that often contain synthetic chemicals.[2], [3], [10], [22] These antimicrobial products, available in various forms like creams, gels, lotions, soaps, and ointments, are commonly used to address skin disorders and enhance skin health.[3] Cosmetics as a whole encompass a wide range of products including skincare, makeup, haircare, fragrances, and personal care items.[10], [22] Skincare products focus on cleansing, hydrating, and treating specific concerns like acne or aging.[20], [21] Makeup enhances facial features and allows for creative expression, while haircare products cater to cleansing, styling, and nourishing different hair types.[8], [13], [23] Fragrances add pleasant scents and evoke emotions, and personal care items support daily hygiene and grooming.[2] The rise of organic and natural cosmetics reflects growing awareness of health and environmental sustainability, with products made from eco-friendly, non-synthetic ingredients.[7] Additionally, cosmetic tools such as brushes, sponges, and curlers aid in precise application and professional-looking results.[7] Altogether, cosmetics influence beauty standards, cultural identity, and personal expression, contributing significantly to self-care, confidence, and the way individuals present themselves to the worldbound.[7]

SKINTYPES AND BASIC SKIN CARE

Normal, dry, oily, combination, and sensitive are the five basic categories into which skin types are typically divided.[3], [4], [5], [6] Normal skin is balanced, neither too dry nor too greasy, has few flaws, and has a healthy complexion.

Due to a lack of moisture, dry skin might feel tight, flaky, or scratchy and can be more prone to fine wrinkles or irritation. Excessive sebum production is a hallmark of oily skin, which can result in larger pores, a glossy appearance, and an increased risk of blackheads and acne.[4], [5] Both dry and oily areas can be found in combination skin, which often has drier cheeks and an oily T-zone (forehead, nose, and chin). Sensitive skin frequently exhibits redness, itching, or burning sensations in response to environmental stimuli or skincare treatments.[14], [1], [3], [7], [10], [24]

HERBAL SOAP

Creating herbal soap possesses antibacterial, anti-aging,antioxidant andantiseptic properties giving it medicinal benefits.[1]It primarily utilizes plant componentslike seeds, rhizomes, nuts, leaves, flowersand pulps to address ailments or wound or to enhance wellbeing. Herbal soaps do not contain artificial colourants, flavourings, fluorides, or other additives.[1]

Figure 5

Figure 6

Herbs are primarily utilized as natural remedies for nearly all ailments and skin issues because of their significant medical value, cost-effectiveness, availability, and compatibility. Herbs, plants, flowers, and botanical extracts are the primary natural components utilizes in the production of the herbal soap.[7] these ingredients were selected due to their health advantaged and are believed to be gentler on skin as compared to the synthetic additives which founds in conventional soaps. [7]The popularity of herbal soaps stems from their capacity to cleanse, nourish, and hydrate the skin while providing aromatherapy benefits.[7]

MOST COMMON DISEASES

Acne and eczema are the two most common skin conditions. Others are dry skin, psoriasis, allergies, rashes, hives, etc.[15] Unique skin issues and herbal remedies applied to particular skin disorders. Everyone on Earth recognizes soap as a common cleaning agent.[1], [7]

Various authorsdefined soap in different ways. Any soluble salt derived from fatty acids containing eight or more carbo n atoms may also be called soap.[1]Soaps are created for various purposes such as washing, cleansing and administrating the medication.[7]The main reason for soap is generally utilized with water for cleaning is due to the hydrocarbon chain's attraction to oil and grease and th e carboxylic group's attraction to water due to its exposure to environmental factors, microorganisms and genetic tendencies, the skin is susceptible to numerous conditions and ailments.[21]

Here are some of the most common skin disorders.

Figure 7

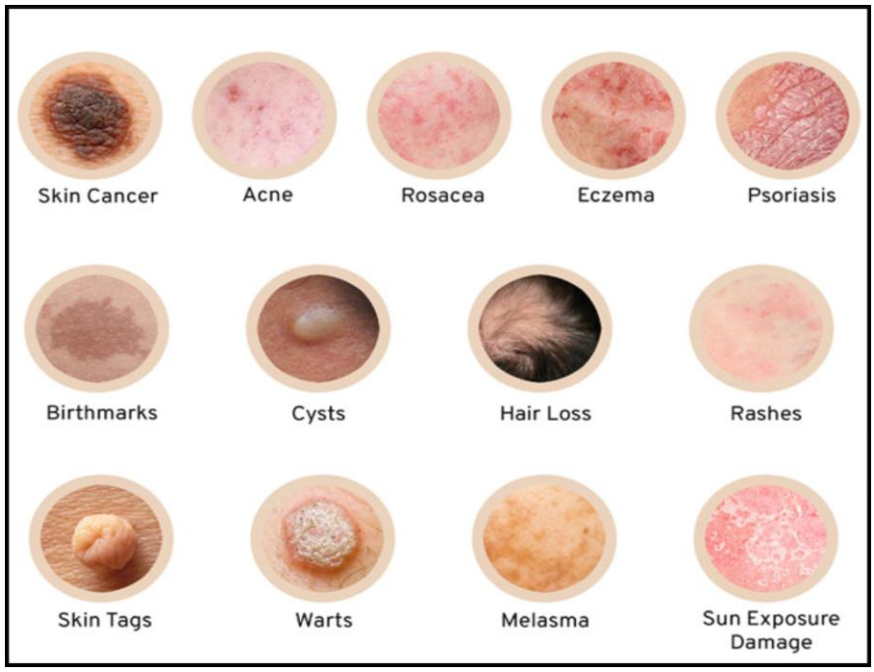

Figure 8

Figure 9

SOAP

Everyone on Earth knows soapas a common cleaning agent.[7]Various authors provide different definitions of soap, any salts of fatty acids that dissolves in water and contains eight or more carbon atoms can also be called as soap.[1] Soaps are created for various purposes including bathing, cleaning and administrating the medicine.[7]

SKIN

It is essential for all healthcare providers to grasp the basics of human skin anatomy and its functions. An alternative ter m for skin is the cutaneous membrane.[5]The surface area of skin in adults varies from 2.2m^2. There are two types of skin: the hairy skin that covers much of the body and the hairless skin located on the palms of hands and the feet.[6]The skin offers a certain level of protection against the infections and is the part of the body that is mostexposed to sunlight and environmental contaminants. The skinis largest organ in human body, serves as a shield that safeguards the internal organs from external elements. [3] The largest organ in the human body serves as a shield that safeguards the internal organs from the external elements. It is crucial for maintaining overall health and wellness. It is very crucial for maintaining overall health and wellness. The skin consists of various layers and fulfils multiple functions including regulation, excretion, sensation, protection.[3], [4], [5], [6]

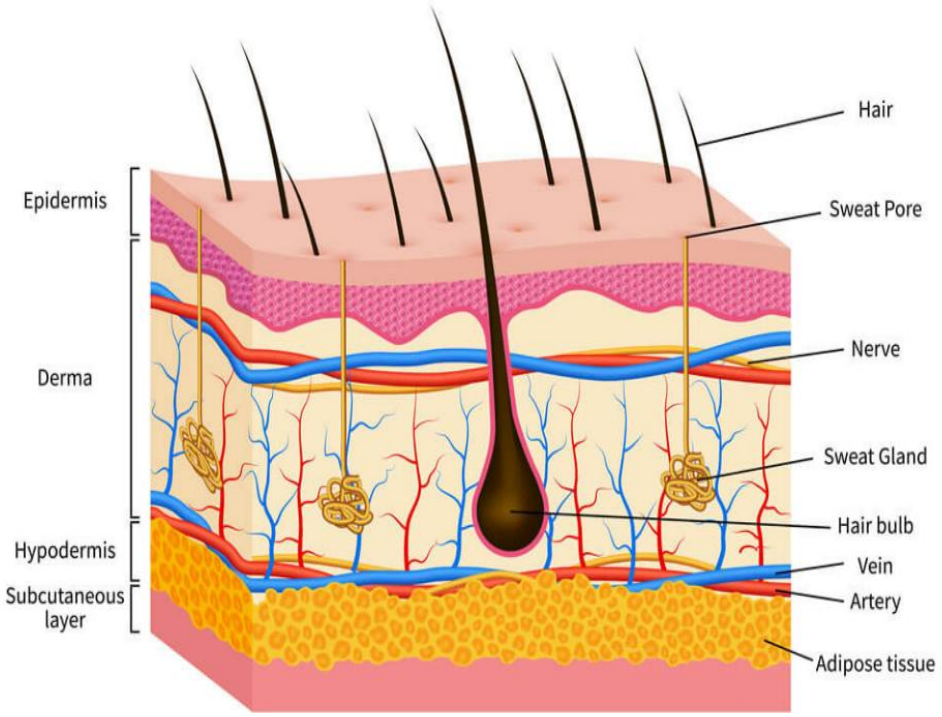

Figure 10

AIM AND OBJECTIVE

Aim
Formulation And Evaluation of Herbal Soap

Objective

1) To formulate and evaluate of herbal soap using solanum virginianum, turmeric and aloe vera
2) To formulate herbal soap or mediated herbal soap with anti-bacterial, anti-microbial and rich antioxidant properties[2], [15], [19], [25], [26], [27]
3) To formulate herbal soap having no/minimum side effects
4) To use natural ingredients instead of synthetic chemicals[1]
5) Formulate the soap using natural, high-quality herbal ingredients known for their skin nourishing properties.[1]
6) Ensure the soap provides specific benefits such as moisturizing, soothingand enhancing skin health without harsh chemicals or synthetic additives.[24]

METHODOLOGY

Content Of Soap[2], [8], [16]
1) Kantakari- Anti-microbial, Anti-inflammatory
2) Turmeric Powder- Anti-inflammatory**,** anti-oxidant
3) Aloe-vera Gel- SkinMoisturiser
4) Rose Water- CoolingAgent
5) Rosemary Oil- Fragrance
6) Soap Base (Glycerine Based)

Kantakari:-
1) Biological source:-solanum virginianum
2) common name:- Kantakari, Dusparsha
3) part typically used:- Dried fruits
4) effect:-Pain relief, Bactericidal

Figure 11

5) Properties:- Anti-microbial, Anti-inflammatory

TUMERIC:-

1) Biological source:- curcuma longa
2) common name:- haldi
3) part typically used:- root
4) effect:-dark spot, natural glow, diminish scars
5) properties:- antibacterial, antiaging, antioxidant

Figure 12

ROSE WATER

1) family :-Rosaceae family
2) biological source :- rosa damascene
3) constituents:- phenethyl alcohol, geraniol, beta-citronellol
4) parts used :- rose petal
5) properties :- antibacterial, anti-inflammatory

Figure 13

ALOEVERA[8]

1) family :- Asphodelaceae
2) biological source:- dried latex of leaves
3) constituents :- amylase, monosaccharide
4) part used:- green part of the leaf
5) properties:- antioxidant, antidiabetics, antiaging

SOAP BASE

Figure 14

Figure 15

INGREDIENTS:-

Solanum extract	Dried fruits powder
Aloe vera	Gel
Rose water	Gel from fresh leaves
Soap base	Glycerine based
Turmeric	Homemade powder
Rosemary essential oil	Cosmetic preparation

PREPARATION AND METHOD[18], [28]

1) Collection Of Necessary Ingredients.
2) The herbal ingredients such as dried herbs and botanical powder are collected.
3) Cut the soap base into small pieces and melt.
4) Stir the soap base until it has melted to smooth consistency.
5) Addition of herbs.
6) Add herbs slowly and stir continuously to ensure they are evenly distributed throughout the soap base.
7) Pour into molds.
8) Once herbals added to base, pour the soap base into molds. Let it cool and harden for hours or overnight.
9) Once the soap is fully cooled and hardened, remove it from the mold and cut it into desired shapes and sizes, store in a cool, dry place until ready to use.

EVALUATION OF HERBAL SOAPS

1. **Physical parameter**
   The herbal soap that was made was examined visually for its colour, weight differences, smell, and visual character istics. The pH in each cream was determined with a pH meter.

2. **Weight variation**
   Gathered 10 soaps to determine their individual weights and ultimately found the average weight of herbal soap.
3. **Washability**
   The formulation will be applied to the skin, and then it will be manually checked after washing with water
4. **Solubility**
   Add 10ml of solvents to 1.5gm of soap, shake for 3 minutes, and then observe the solubility result
5. **Skin irritancy test**
   Indicate a region (2sq. Cm) on the dorsal surface of the right side. The herbal soap was used on the right-hand side in the designated area and at the moment, observe what occurred with the hand. Irritancy, erythema, oedema was monitored at regular intervals for up to 24hrs and subsequently recorded.
6. **Foam height test**
   Dissolve 0.4gm of prepared soap in distilled water and make up the volume up to 50ml with distilled water on 100ml of measuring cylinder. Measure the foam height above the aqueous volume after the 25 strokes.

RESULT AND DISCUSSION

Parameter		Observation	
		Batch 1	Batch 2
1	Physical Appearance		
	Color Uniformity	Uniform Color Distribution	Uniform Color Distribution
	Cracks	No	No
	Air Bubbles	No	No
	Surface Damage	No	No
	Color	Reddish	Reddish
	Texture	Smooth	Smooth
2	Hardness	Good	Good
3	pH	5.5-7	5.5-7
4	Moisture Content	No Catch Moisture	No Catch Moisture
5	Foam Height Test	Good	Good
6	Odor	Pleasant	Pleasant
7	Lathering Ability	Good	Good
8	Washability	Good	Good
9	Stability	Stable At Room Temp.	Stable At Room Temp.
10	Avg. Weight	74gm	75gm
11	Skin Irritancy	No Irritancy	No Irritancy
12	Solubility	Soluble	Soluble

Figure 16

A stable and efficient herbal cleansing product was successfully developed, as evidenced by the examination of the two batches of herbal soap that showed encouraging results across all measured criteria. Batches 1 and 2 both displayed a smooth and consistent formulation with a uniform colour distribution and no obvious surface damage, air bubbles, or fractures. The natural pigments found in the herbal ingredients, such as turmeric and Solanum extract, are responsible for the crimson hue seen in both batches. The soaps' smooth texture and good hardness were evaluated as indicators of their structural soundness and consistency for ease of use.

Both batches' pH values fell between 5.5 to 7, which is the optimal range for skin-friendly goods and reduces the possibility of skin irritation. Both batches showed no signs of moisture, indicating adequate drying and less opportunities for microbial development. According to ratings, the foam height and lathering capabilities were good, meeting customer expectations for usage and satisfactory cleaning. Furthermore, both batches smelled good, which was probably caused by the addition of rosewater and rosemary oil, which improved the sensory experience.

Additionally, good wash ability was discovered, guaranteeing that the soap will rinse off without leaving any residue on the skin. At room temperature, neither formulation showed any signs of deterioration. With Batch 1 weighing 74 g and Batch 2 weighing 75 g, the average weights were consistent, suggesting that production was uniform. Crucially, the safety of the herbal components utilized was confirmed by the absence of any negative reactions in the skin irritancy testing. Lastly, it was discovered that the soaps were soluble, which is necessary for efficient application and removal while in use. The results collectively confirm that the herbal soap formulations are safe, effective, and satisfy the fundamental quality standards anticipated from a natural skin care product.

CONCLUSION

Natural skincare products offer numerous therapeutic and dermatological benefits, contributing to improved skin health and overall well-being. Their development emphasizes sustainability and reduced environmental impact, aligning with global efforts toward eco-conscious living. The field also presents valuable opportunities for academic and research contributions, driving innovation in product formulation and therapeutic applications. As consumers increasingly prioritize safety and satisfaction, natural products are gaining popularity for their gentle yet effective results. This growing demand not only fosters innovation in product development but also holds significant economic potential, benefiting both manufactures and the broader market.

A crafted herbal soap formulation (comprising solanumvirginianum, aloe vera, turmeric, and rose water) is effective for antimicrobial treatment. They are likewise utilized as a cleanser to remove dirt and moisture from the skin, and they possess antifungal, antibacterial, and anti-inflammatory attributes**.**

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